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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/592,982	01/18/2008	Orhan Ustun	0115-062616	9911

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THE WEBB LAW FIRM, P.C.  
ONE GATEWAY CENTER  
420 FT. DUQUESNE BLVD, SUITE 1200  
PITTSBURGH, PA 15222

EXAMINER
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KAMPS, FRANCES H

ART UNIT	PAPER NUMBER
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3749

NOTIFICATION DATE	DELIVERY MODE
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07/26/2011

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patents@webblaw.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/592,982	<b>Applicant(s)</b> USTUN, ORHAN	
	<b>Examiner</b> FRANCES H. KAMPS	<b>Art Unit</b> 3749	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2011.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 9 and 15-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9 and 15-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

***Response to Arguments***

1. Applicant's arguments filed June 2, 2011 have been fully considered but they are not persuasive.
2. **In response to Applicant argument:**

"It is the prestressed heat-conducting elements and the fluid-conducting pipe system that connect and attach the vacuum tube to the manifold. Applicant asserts that Takeuchi, Helmut and Ghela, alone or in combination, so not teach or suggest this limitation either directly or inherently."

**Examiner respectfully responds:**

Since the fluid-conducting pipe system is

- directly connected to the manifold;
- attached to the heat-conducting element; and

since the vacuum tube is indirectly connected to the heat-conducting element, the vacuum tube is indirectly connected to both the fluid-conducting pipe system and the manifold.

According to Applicant's characterization of the function of the spiral heat conducting element of Helmut, the claim limitation of "*wherein the vacuum tube is resiliently connected to the manifold by means of the prestressed heat conducting elements*" is inherently present within the proposed combination. Particularly, if the spiral-shaped heat conducting element *holds the entire device based on the central metal piping*, as alleged by Applicant, and the spiral-shaped heat conducting element IS a resilient member, as disclosed by Helmut (page 2, paragraph 5) then it follows that *the vacuum tube is resiliently connected to the manifold by means of the prestressed heat conducting elements*.

Additionally, Applicant asserts that *it is known for someone skilled in the art that the pipes (shown on the right hand side of FIG. 1 of the Takeuchi patent, below) are attached to a manifold*

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(*Applicant Remarks*, pg 4, 1/03/2011). Examiner agrees with Applicant's assertion and points out that this further bolsters the above position that the feature in question will naturally result from the proposed combination of Takeuchi, Helmut and Ghela.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 9 and 15 – 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Takeuchi et al (US 4,440,156) in view of Helmut et al (DE 198 59 658 A1) in view of Ghela (US 6,619,283).**

5. **In re Claim 9**, Takeuchi et al ('156) discloses a solar collector (figs 1, 3), comprising a manifold (apparent / well known. See above; *Response to Arguments*. See also US 4,119,085) and a plurality of heat exchangers, wherein each heat exchanger comprising:

- a vacuum tube (1 / 2; col 2, ln 26) having an inner wall (2), wherein the vacuum tube is a glass tube (col 2, lns 12 – 14);
- a fluid-conducting pipe system (4) adapted to hold a fluid (col 2, lns 28-29), wherein the fluid-conducting pipe system comprises an outer wall (inherent) connected to the manifold;
- at least one heat-conducting element (7, 8) made of metal ("thin metal plate"; col 2, ln 38) connecting the inner wall of the vacuum tube (2) to a the outer wall of the fluid-conducting pipe system (4) (col 3, lns 20 – 23); and
- means for collecting and concentrating solar energy ("solar heat-absorbing film" (3)) provided on a side of the inner wall of the vacuum tube (col 2, lns 18 – 20) facing away from the at least one

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heat-conducting element (7, 8), wherein the outer wall of the fluid conducting pipe system is a metal wall ("metal pipe... preferably....copper"; col 2, lns 27, 28);

- wherein the heat-conducting element is contacting the outer wall of the fluid-conducting pipe system (fig 3) and prestressed (col 2, lns 56 – 58; "*biased*") against the inner wall of the vacuum tube and the fluid-conducting pipe system,
- wherein the vacuum tube is indirectly resiliently connected to the manifold by means of the prestressed heat conducting elements (best seen in fig 3) and the fluid-conducting pipe system.  
(The vacuum tube is connected to the pipe (4) (which would then be connected to a manifold) via the prestressed heat conducting elements 7/8).

6. Regarding the limitations "wherein the vacuum tube is indirectly resiliently connected to the manifold by means of the prestressed heat conducting elements and the fluid-conducting pipe system",  
Since the fluid-conducting pipe system is

- directly connected to the manifold;
- attached to the heat-conducting element; and

since the vacuum tube is indirectly connected to the heat-conducting element,

the vacuum tube is indirectly connected to both the fluid-conducting pipe system and the manifold.

7. Takeuchi et al ('156) lacks:

- a plurality of heat exchangers; and
- wherein:
  - each heat-conducting element
    - extends in a spiral shape along a cross- section of the heat exchanger, covers an angle of at least 450 degrees,
    - is attached at the outer wall of the fluid-conducting pipe system, and
  - the outer wall of the fluid-conducting pipe system is centered concentric to the inner wall of the vacuum tube.

8. Helmut et al ('658) teaches a solar collector comprising a plurality (pg 3, paragraph 6) of heat exchangers (figs 1, 2a (1)) having a vacuum tube (2) wherein:

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- an outer wall of a fluid-conducting pipe (13) system is centered concentric to the inner wall of the vacuum tube (2), employing a counterflow heat exchange flow configuration, and
- each heat-conducting element (3) extends in a spiral shape along a cross-section of the heat exchanger covers an angle of at least 450 degrees (as apparent in fig 2a),

9. Additionally, such solar collectors having a plurality of heat exchanging units are well known (an array).

10. It would have been obvious to one having ordinary skill in the art at the time the invention was made modify the system of Takeuchi et al ('156), as taught by Helmut et al ('658), such that there are a plurality of heat exchangers and such that the fluid conducting pipe system is constructed as a concentric counterflow system in lieu of a single pass "U-tube" system to increase heat exchange surface area and thereby increase system efficiency.

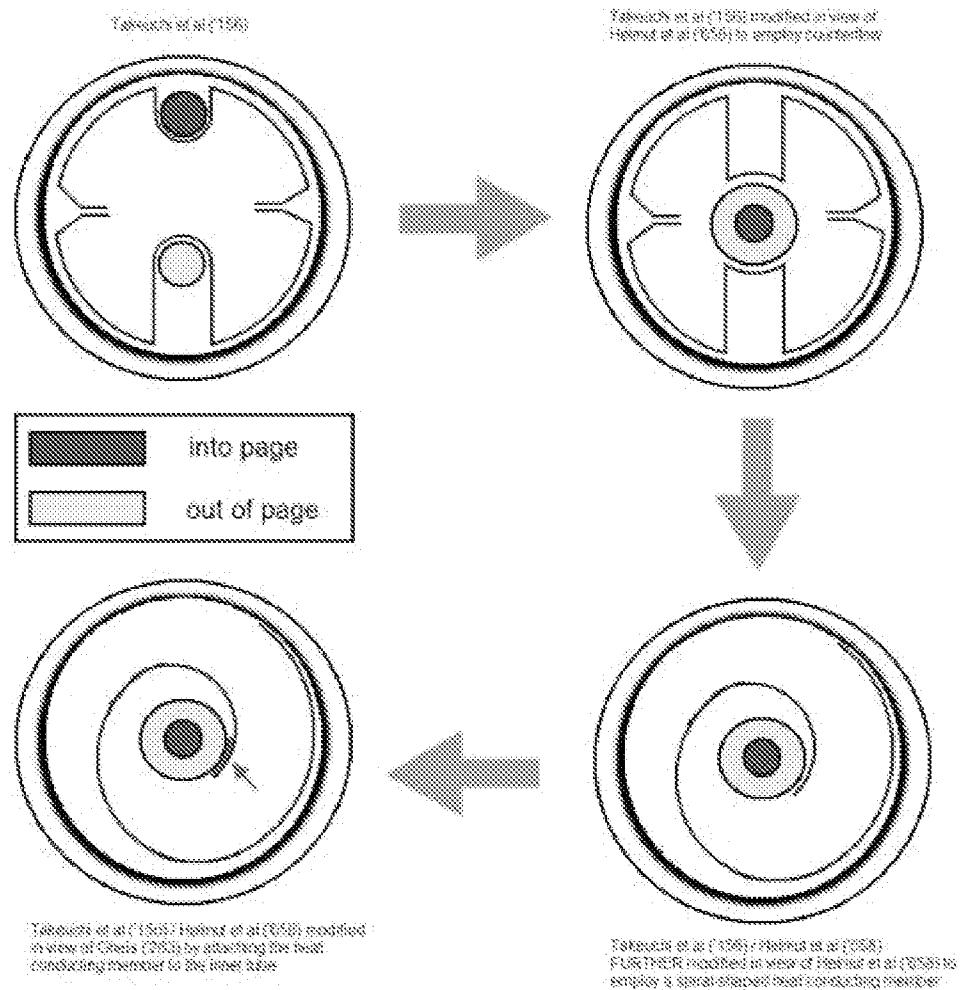
11. Such a combination would yield *wherein the vacuum tube is resiliently connected to the manifold by means of the prestressed heat conducting elements* (See above; *Response to Arguments*).

12. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Takeuchi et al ('156), as taught by Helmut et al ('658) such that each heat-conducting element extends in a spiral shape along a cross-section, covering an angle of at least 450 degrees, in the system of Takeuchi et al ('156) in the system of in order to maximize the thermal output of a solar collector, for the purpose of increased efficiency.

13. Ghela ('283) teaches a solar collector pipe (70) wherein a heat-conducting element (72) is attached at the outer wall of a fluid-conducting pipe (71) system (col 11, lns 39 - 46).

14. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Takeuchi et al ('156), as taught by Ghela ('283), such that heat is more readily transferred from the heat conducting elements to the fluid-conducting pipe system (col 11, lns 45, 46), thereby improving system efficiency.

15. The resultant combination of Takeuchi et al ('156) as taught by Helmut et al ('658) and Ghela ('283) would be as follows:



16. **Claims 1 – 8 and 10 – 14 have been cancelled by Applicant.**

17. **In re Claim 15**, the heat exchanger of Takeuchi et al ('156) / Helmut et al ('658) / Ghela ('283) had been discussed, wherein the modified heat exchanger utilizes a single heat conducting element (Helmut et al ('658) fig 2a; (3)) over an angular range between 350 to 359 degrees or between 90 and 179 degrees. However, the heat exchanger of Takeuchi et al ('156) discloses the use of two heat conducting elements (7, 8) spaced apart from one another in an angular arrangement on an outer wall of a fluid-conducting pipe system.

18. It would have been obvious to one having ordinary skill in the art to use the teaching of Takeuchi et al ('156) such that two heat conducting elements are utilized, doubling the collection area of the single heat conducting element of Helmut et al ('658) fig 2a; (3)), spaced apart from one another in an angular

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arrangement on an outer wall of the fluid-conducting pipe system over an angular range between 350 to 359 degrees or between 90 and 179 degrees, to optimally cover the entire internal circumference of the inner wall of the vacuum tube to in order to maximize the thermal output of a solar collector, for the purpose of increased efficiency.

19. Please also note that Helmut et al ('658) additionally teaches three heat-conducting elements (fig 2c; (3)), wherein three of the heat-conducting elements are spaced apart from one another in an angular arrangement on an outer wall of the fluid-conducting pipe system over an angular range that encompasses / covers the entire internal circumference of the inner wall of the vacuum tube, as further evidence that the mere duplication of the essential working parts of a device involves only routine skill in the art.

20. **In re Claim 16**, the heat exchanger of Takeuchi et al ('156) / Helmut et al ('658) / Ghela ('283) had been discussed, wherein Helmut et al ('658) teaches a fluid-conducting pipe system comprises an outer volume (6) and an inner volume (7) ("co-axial"; page 2, fourth paragraph) operable in a counter-current mode (fig 7).

21. **In re Claim 17**, the heat exchanger of Takeuchi et al ('156) / Helmut et al ('658) / Ghela ('283) had been discussed, wherein Takeuchi et al ('156) discloses the fluid is a heat-conducting fluid (col 3, Ins 6, 7), and the fluid is contained within the inner tube (7, 8).

22. **In re Claim 18** the heat exchanger of Takeuchi et al ('156) / Helmut et al ('658) / Ghela ('283) has been discussed (see above in Claim 9), wherein Ghela ('283) teaches the at least one heat-conducting element is attached at the outer wall of a fluid-conducting pipe (71) system ("through a common extrusion process or... in direct contact" col 11, Ins 39 - 46). Hard-soldering a heat-conducting element at the outer wall of the fluid-conducting pipe system is merely another example of making two components into an integral piece. It would have been obvious to one having ordinary skill in the art at the time the invention was made to hard-solder a heat-conducting element to an outer wall of a fluid-conducting pipe, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art.



***Conclusion***

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRANCES KAMPS whose telephone number is 571.270.5726. The examiner can normally be reached on M-F; 8-5.

24. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

25. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

26. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve McAllister can be reached on 571.272.6785. The fax phone number for the organization where this application or proceeding is assigned is 571.273.8300.

27. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866.217.9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800.786.9199 (IN USA OR CANADA) or 571.272.1000.

/FRANCES KAMPS/  
Examiner, Art Unit 3749

/STEVEN B. MCALLISTER/  
Supervisory Patent Examiner, Art Unit 3749